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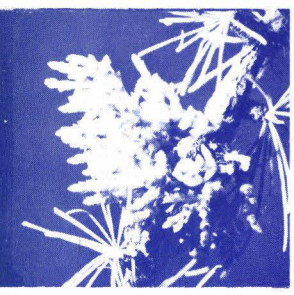

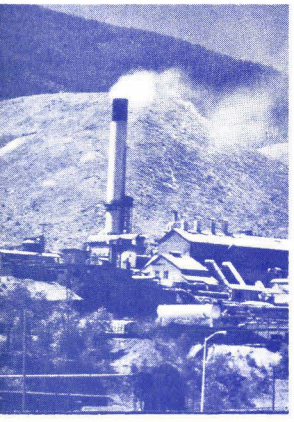

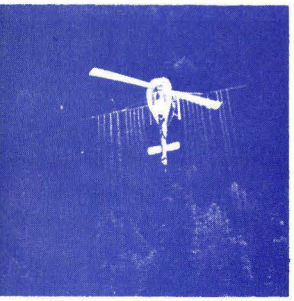

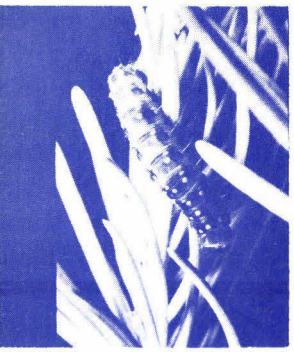

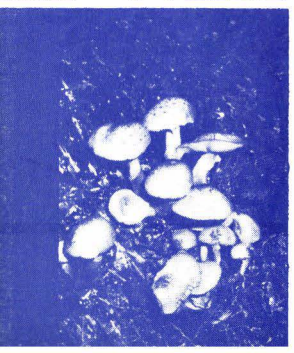

FOREST INSECT & DISEASE MANAGEMENT

USDA · FOREST SERVICE · NORTHERN REGION

State & Private Forestry · Missoula, MT 59801

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EVALUATION OF PROPOSED DWARF MISTLETOE MANAGEMENT PROJECTS ON THE SWAN LAKE RANGER DISTRICT, FLATHEAD NATIONAL FOREST

By

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SUMMARY

Residual lodgepole pine, Douglas-fir, and western larch in older clearcuts are dwarf mistletoe-infected and pose a threat to regeneration. Removal of residuals coupled with planned or completed precommercial thinnings will effectively reduce dwarf mistletoe to an insignificant level and increase future volume yields. The benefit/cost ratio based on timber values alone is 0.62/1 at 10 percent and 5.81/1 at 6 percent. Elimination of dwarf mistletoe infection for many rotations outweigh the economic ones for the first rotation. Control is recommended.

INTRODUCTION

The Swan Lake Ranger District has proposed the removal of dwarf mistletoe-infected lodgepole pine, Douglas-fir, and western larch overstory from 800 acres to protect regeneration from infection. I evaluated a sample of these areas on May 26, 1978. The areas will be surveyed by the District prior to overstory removal.

TECHNICAL INFORMATION

Causal agents.--Lodgepole pine dwarf mistletoe, Arceuthobium americanum Nutt. ex Engelm.; Douglas-fir dwarf mistletoe, A. douglasii Engelm; and western larch dwarf mistletoe, A. laricis (Piper) St. John.

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ROCKY MOUNTAIN STATION

Hosts.--Lodgepole pine, Pinus contorta Dougl.; Douglas-fir, Pseudotsuga menziesii (Mirb.) Franco; and western larch, Larix occidentalis Nutt.

Type of damage.--Reduction of tree vigor, reduction of height and diameter growth, and some mortality.

DESCRIPTION OF AREAS AND PROPOSED TREATMENT

General location of the proposed areas is shown in figure 1. Location of specific areas is shown in figures 2, 3, and 4.

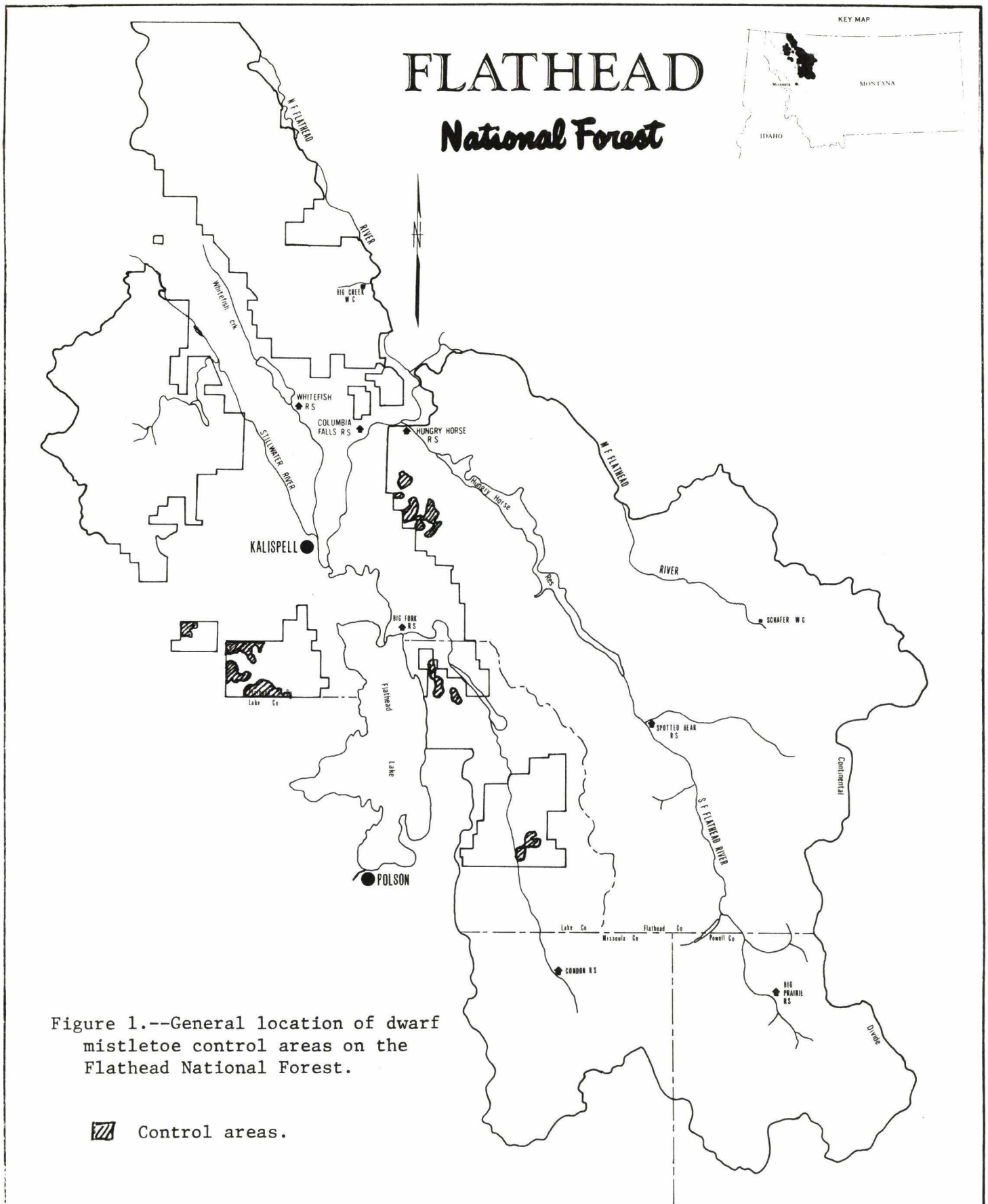

Figure 1.--General location of dwarf mistletoe control areas on the Flathead National Forest.

Control areas.

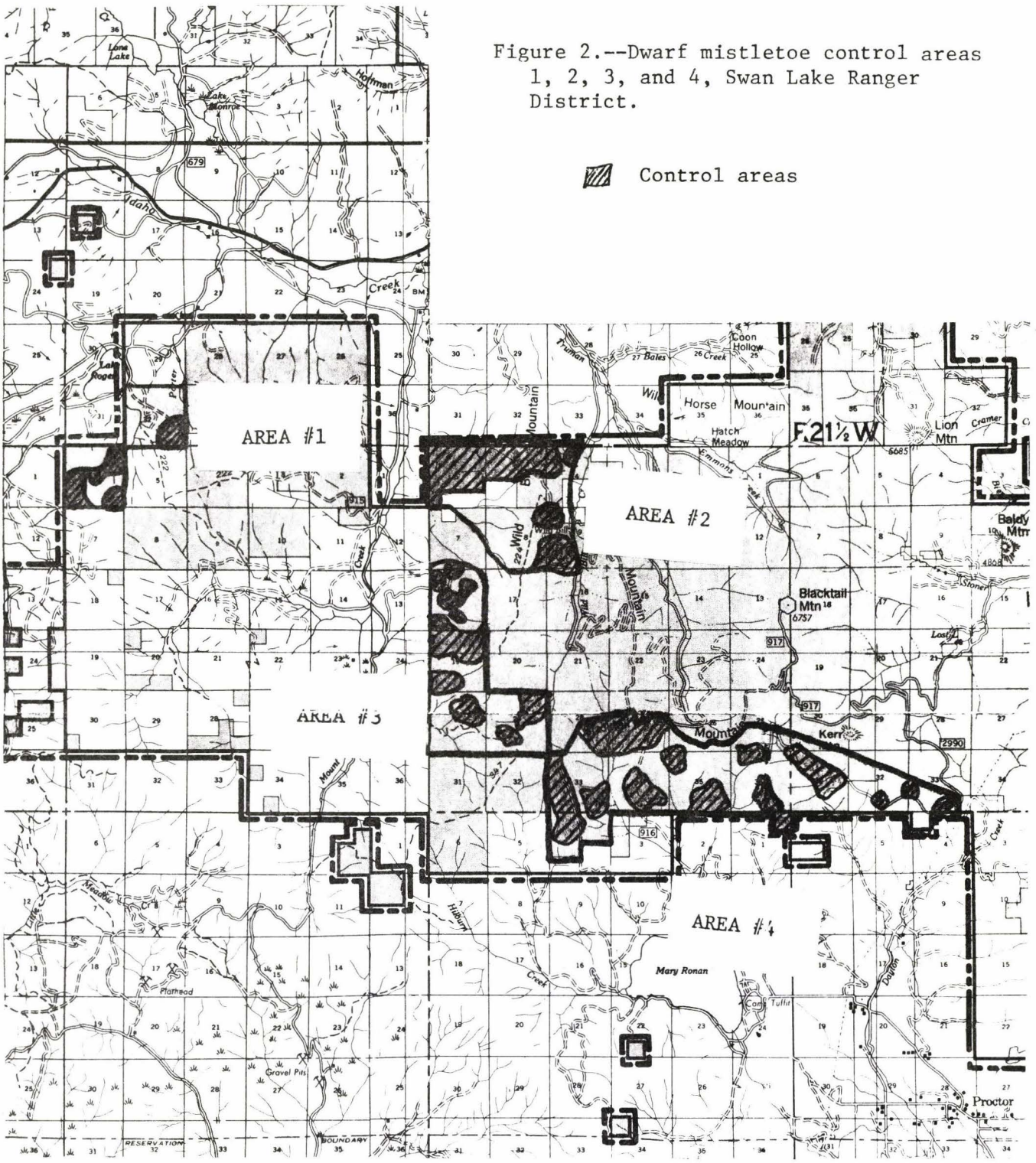

Figure 2.--Dwarf mistletoe control areas 1, 2, 3, and 4, Swan Lake Ranger District.

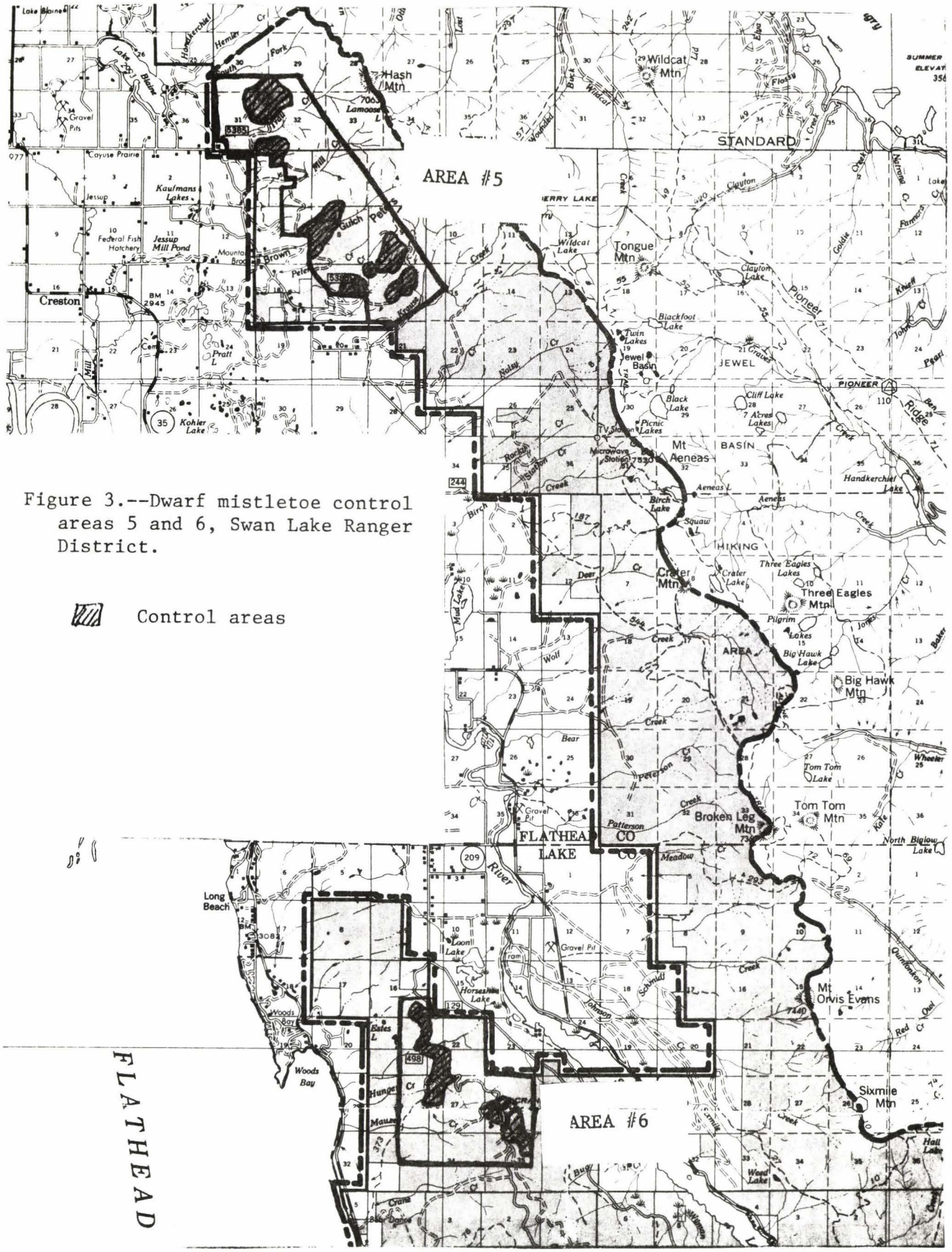

Figure 3.--Dwarf mistletoe control areas 5 and 6, Swan Lake Ranger District.

Control areas

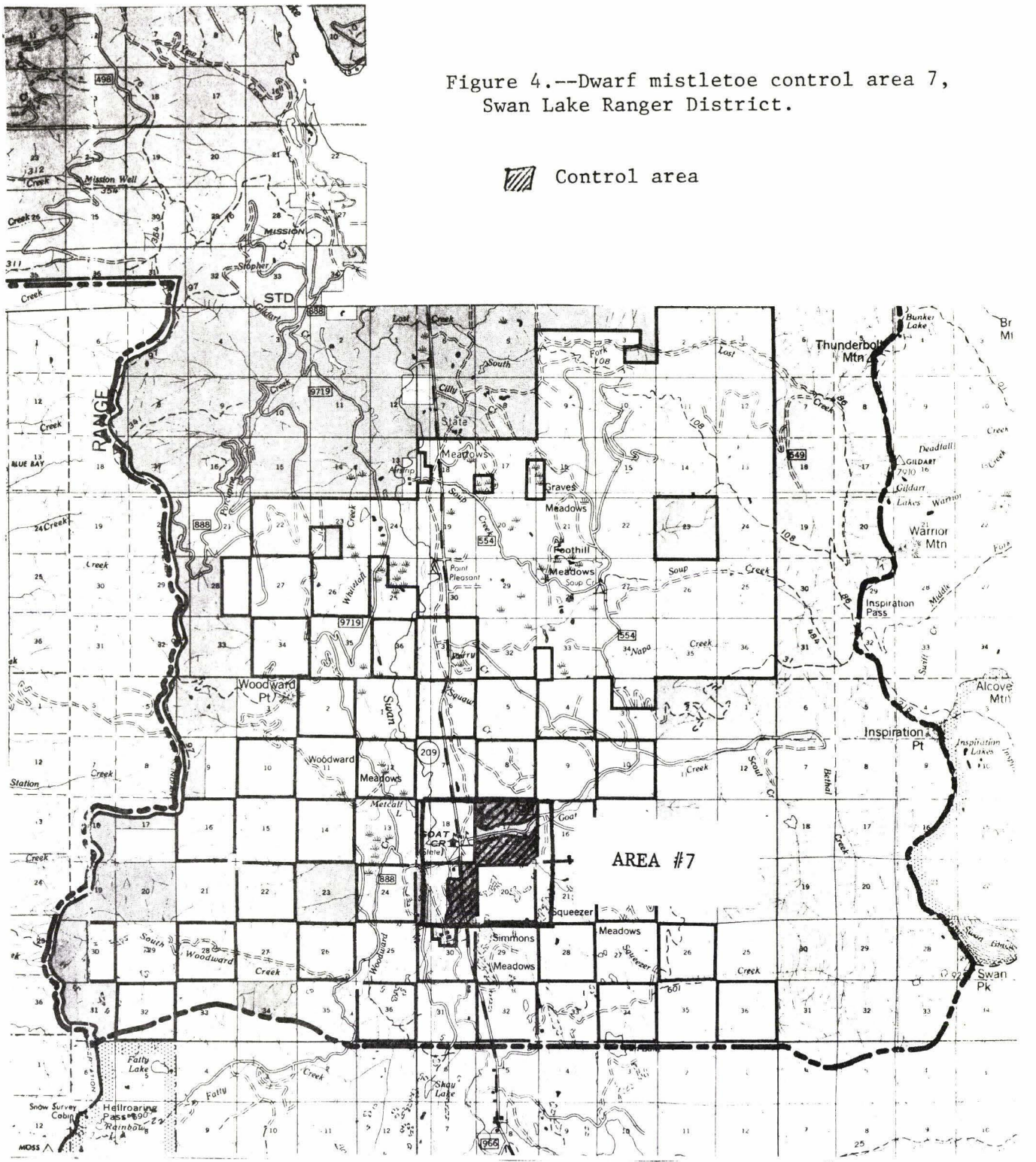

Figure 4.--Dwarf mistletoe control area 7, Swan Lake Ranger District.

Proposed treatment is to remove residual dwarf mistletoe-infected lodgepole pine, Douglas-fir, and western larch overstory trees from cutover stands with advanced reproduction. Average number of overstory trees will be determined by a presuppression survey. Specific areas to be covered by the project are:

Number	Area Name
1	Haskill-Rogers
2	Mount Creek-Wild Bill
3	Upper Mount Creek
4	Dayton-Ronan
5	Trail Brown
6	Outcrop Overstory
7	Goat Creek Sections 17 and 19

FIDM targets for the project are shown in figure 5.

DISCUSSION

Dwarf mistletoes are responsible for the most serious disease losses in the forests of western Montana. Growth losses of 50 percent or more are common. Dwarf mistletoes not only cause growth loss and direct mortality, but also predispose trees and entire stands to attack by other disease organisms and insects.

Removal of infected overstory trees removes the dwarf mistletoe seed source, and the young stand remains essentially free of infection throughout the rotation.

Benefit/Cost Analysis

Yield projections on the Flathead National Forest for one precommercial and one commercial thinning show the following volumes:

Cutting age	Species[a/]	Volume recovery (MBF)	Value per MBF[b/]	Total recovery Value ($)
20	LPP	-	-	-
	DF	-	-	-
	WL	-	-	-
70	LPP	1	44	44
	DF	4	56	224
	WL	3	86	258
90	LPP	5	44	220
115	DF	15	56	840
	WL	10	86	860
Totals		38		2,446

a/ LPP - lodgepole pine
DF - Douglas-fir
WL - western larch

b/ Current net stumpage value on the Flathead National Forest.

By applying a 10 percent discount rate to these values, the present net worth (pnw) of dwarf mistletoe control is:

Time (n)	Species	Dollar value	Discount factor[a/]	pnw ($)
55	LPP	44	0.0053	0.23
	DF	224	0.0053	1.19
	WL	258	0.0053	1.37
75	LPP	220	0.0008	0.18
100	DF	840	0.00007	0.06
	WL	860	0.00007	0.06
Totals		2,446		3.09

a/ Present value of $1.00 for n years @ 10%.

By applying a 6 percent discount rate to these values, the pnw of dwarf mistletoe control is:

Time (n)	Species	Dollar value	Discount factor[a/]	pnw ($)
55	LPP	44	0.0406	1.79
	DF	224	0.0406	9.09
	WL	258	0.0406	10.47
75	LPP	220	0.0126	2.77
100	DF	840	0.0029	2.44
	WL	860	0.0029	2.49
Totals		2,446		29.05

a/ Present value of $1.00 for n years @ 6%.

FIDM TARGETS

FOR THE Swan Lake Dwarf Mistletoe SUPPRESSION PROJECT
(Name of Project)

	Acres (in M)	Vol. Protected (in MCF)	Vol. Removed (in MCF)
I&D Presuppression-Operational Survey	0.8	XXXXXXXXXXXXXX	XXXXXXXXXXXX
I&D Prevention/Suppression Using Biological Methods			
I&D Prevention/Suppression Using Chemical Methods			
I&D Prevention/Suppression Using Silviculture/Mechanical Methods. . .	0.8	5,600	80
Total	1.6	5,600	80

Figure 5. FIDM targets for Swan Lake dwarf mistletoe control area.

Cost of treatment will be $5.00 per acre. By dividing the pnw of the benefits by the treatment cost, the benefit/cost ratio at 10 percent is 0.62/1 and at 6 percent is 5.81/1.

These calculations assume the value of stumpage will remain at present levels for 55, 75, and 100 years. This is probably false; stumpage prices will continue to rise, the benefits will be greater, and the benefit/cost ratios will increase.

There will also be value added to the economy. Each million board feet of timber cut creates 7 person-years of employment paying an average of $13,400 per year. This will generate 0.08, 0.05, and 0.25 years of employment in 55, 75, and 100 years respectively, and add $5,092 to the economy.

Another benefit not directly related to pnw in dollars is the reduction in dwarf mistletoe infection at each stand entry. By the end of the first rotation, each area should be essentially dwarf mistletoe-free and should remain so for many rotations.

RECOMMENDATIONS

Decision for control.--Dwarf mistletoe management is biologically and economically sound (at the 6 percent rate) and should be done.

Control method.--Removal of dwarf mistletoe-infected overstory trees from cutover stands with advanced regeneration is the method selected.

Impact of control on other resources.--Because management of dwarf mistletoe will be by removal of residuals from areas already clearcut, there will be no additional adverse impact on other resources. Environmental Analysis Reports for the areas are being written and will be on file at the Swan Lake Ranger District Office in Bigfork, Montana.